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EXAMINER
CONNELLY CUSHWA, MICHELLE R

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2874	

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/085,798	Applicant(s) BERKEY ET AL.	
	Examiner Michelle R. Connelly-Cushwa	Art Unit 2874	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *25-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,10,11,18,21,23,24 and 32* is/are rejected.

7)☒ Claim(s) *5-9,12-17,19,20,22 and 33-36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 July 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-24 and 32-36, drawn to an optical fiber, classified in class 385, subclass 123.

II. Claims 25-31, drawn to a method of designing an optical fiber, classified in class 385, subclass 147.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the optical fiber as claimed in Group 1, claims 1-24 and 32-36, can be made by other methods of designing and the method of designing an optical fiber as claimed in Group II, claims 25-31, can be used to design different optical fibers.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with William J. Chervenak on May 21, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-24 and 32-36. Affirmation of this election must be made by applicant in

replying to this Office action. Claims 25-31 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

Fourteen (14) sheets of formal drawings were filed on July 9, 2002 and have been accepted by the Examiner.

Specification

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 10, 11, 18, 21, 23, 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarchi et al. (US 2002/0102082 A1).

Regarding claims 1-4, 10 and 11; Sarchi et al. discloses all of the limitations of these claims, except for specifically stating that the bandwidth is at least approximately 0.6 GHz.km at 850 nm.

Sarchi et al. discloses an optical fiber in Figure 10b comprising:

- a core, the core including an inner core (150), a first glass layer (152) and a second glass layer (154); and
- a cladding (156);
- the second glass layer (154) of the core including an alpha profile with an alpha parameter that may be in the range of 1 to 4 (see paragraph [0163], values of 2 to 4 would fall in the ranges of 2 to 8 and 2 to 4);
- the second glass layer (154) of the core having a maximum index percent difference (the maximum refractive index difference multiplied by 100%) that may be in the range of 0.1% to 0.3% (see paragraph [0163], a value of 0.3% would fall in the ranges of 0.3% to 0.5% and 0.3% to 0.4%);
- the core having a diameter of about 6.4 μm (see paragraph [0163], which falls within the ranges of 6.0 μm to 16.0 μm and 6.0 μm to 14.0 μm); and
- the cable cut-off wavelength being less than 1250 nm (see paragraph [0166], wavelengths less than 1250 nm fall in the range of 1050 nm to 1300 nm);

- wherein the an index profile of the core is configured in accordance with an operating wavelength, the bandwidth desired at the operating wavelength, and a length of the optical fiber (see paragraphs [0160] through [0166], Figures 10a and 10b, and Tables 13 and 14);
- wherein the index profile of the core includes a peak bandwidth wavelength (1310 nm) offset from an operating wavelength (1550 nm), that offset inherently being sufficient to reduce intermodal noise.

The optical fiber of Sarchi et al. meets all of the structural limitations of the optical fiber of claim 1 and, thus, would inherently have the same bandwidth as an optical fiber of claim 1, including a bandwidth of at least approximately 0.6 GHz.km at 850 nm, since the bandwidth over which an optical fiber transmits is determined by the structure and properties of the optical fiber.

Regarding claim 18; the offset between the peak bandwidth wavelength (1310nm) and the operating wavelength (1550 nm) is inherently sufficient to substantially reduce intermodal noise at the operating wavelength in the invention of Sarchi et al., since the fiber disclosed by Sarchi et al. meets all of the structural limitations of claim 18 as applied to claim 1 above.

Regarding claim 21; the fiber disclosed by Sarchi et al. is configured for multimode operation at a wavelength less than 1300 nm and single mode operation at a wavelengths of 1310 nm and 1550 nm.

Regarding claims 23 and 24; Sarchi et al. teaches all of the limitations of claims 23 and 24 as applied to claims 1 and 18 above.

Regarding claim 32; Sarchi et al. teaches all of the limitations of claim 32 as applied to claims 1, 18 and 21 above, except for specifically stating that a light source is optically coupled to the optical fiber. Optical fibers are light guides and in order for an optical fiber to guide light, the light must inherently be coupled from a light source into the optical fiber. Thus, one of ordinary skill in the art would have found it obvious to couple a light source to the optical fiber disclosed by Sarchi et al. to transmit an operating wavelength into the optical fiber, especially since, Sarchi et al. teaches that the optical fiber is for use in an optical network.

Allowable Subject Matter

Claims 5-9, 12-17, 19, 20, 22 and 33-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claims 5-9, 12-17, 19, 20, 22 and 33-36 distinguishes over the prior art of record for the following reasons.

Regarding claims 5 and 6; the claims are allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 5 or in claim 6, wherein the effective area is greater

than 70 μm^2 at 1550 nm ore greater than 90 μm^2 at 1550 nm in combination with the limitations defined in claim 1.

Regarding claims 7 and 8; the claims are allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 7 or in claim 8, wherein the pin array bend loss is less than 4 dB at 1550 nm or less than 2 dB at 1550 nm in combination with the limitations defined in claim 1.

Regarding claim 9; the claim is allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 9, wherein the mode field diameter is greater than or equal to 10 μm.

Regarding claims 12 and 13; the claims are allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 12, wherein the maximum index percent different between the core and the cladding is in the range from 0.35% to approximately 0.4% and the core diameter is in the range from 14.0 μm to 16.0 μm, to provide a waveguide fiber having an effective area greater than 90 μm^2 at 1550 nm, and a mode field diameter greater than 11 μm in combination with the other limitations of claim 12. Claim 13 depends form claim 12.

Regarding claims 14 and 15; the claims are allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 14, wherein the maximum index percent different

between the core and the cladding is in the range from 0.35% to approximately 0.4% and the core diameter is in the range from 12.0 μm to 15.0 μm, to provide a waveguide fiber having an effective area greater than 85 μm^2 at 1550 nm, and a mode field diameter greater than 10.5 μm in combination with the other limitations of claim 14. Claim 15 depends form claim 14.

Regarding claims 16 and 17; the claims are allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 16, wherein the core diameter is in the range from 12.0 μm to 16.0 μm, to provide a waveguide fiber having an effective area greater than 85 μm^2 at 1550 nm, and a mode field diameter greater than 10.5 μm in combination with the other limitations of claim 16. Claim 17 depends form claim 16.

Regarding claims 19 and 20; the claims are allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 19, wherein at the operating wavelength each mode has a group time delay and all of the group time delays are either all positive or negative, each of the group time delays being referenced relative to a lowest order mode (LP_{01} mode) associated with the optical fiber. Claim 20 depends from claim 19.

Regarding claim 22; the claim is allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 22, wherein a difference in a group time delay is at least one of all positive and all negative for all modes in the multimode operation of the

optical fiber, each of the group time delay being referenced relative to a lowest order mode (LP_{01} mode) associated with the optical fiber.

Regarding claim 33; the claim is allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 33, wherein the length of the optical fiber is in the range of approximately 10 m to approximately 20 m and an absolute value of the difference between the operating wavelength and the peak bandwidth wavelength is in the range of approximately 80 nm to approximately 150 nm in combination with the other limitations of claim 33.

Regarding claim 34; the claim is allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 34, wherein the length of the optical fiber is in the range of approximately 20 m to approximately 100 m and an absolute value of the difference between the operating wavelength and the peak bandwidth wavelength is in the range of approximately 12 nm to approximately 80 nm in combination with the other limitations of claim 34.

Regarding claim 35; the claim is allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 35, wherein the length of the optical fiber is in the range of approximately 100 m to approximately 1000 m and an absolute value of the difference between the operating wavelength and the peak bandwidth wavelength is in

the range of approximately 2 nm to approximately 12 nm in combination with the other limitations of claim 35.

Regarding claim 36; the claim is allowable over the prior art of record because none of the reference either alone or in combination disclose or render obvious an optical fiber as defined in claim 36, wherein the length of the optical fiber is greater than 1000 m and an absolute value of the difference between the operating wavelength and the peak bandwidth wavelength is greater than zero and less than approximately 2 nm in combination with the other limitations of claim 33.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claims 5-9, 12-17, 19, 20, 22 and 33-36.

Conclusion

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (703) 305-5327. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.)

should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956 or to the technical support staff supervisor at telephone number (703) 308-3072.

Michelle R. Connelly-Cushwa
MRCC
June 3, 2003

AKM ENAYET ULLAH
PRIMARY EXAMINER